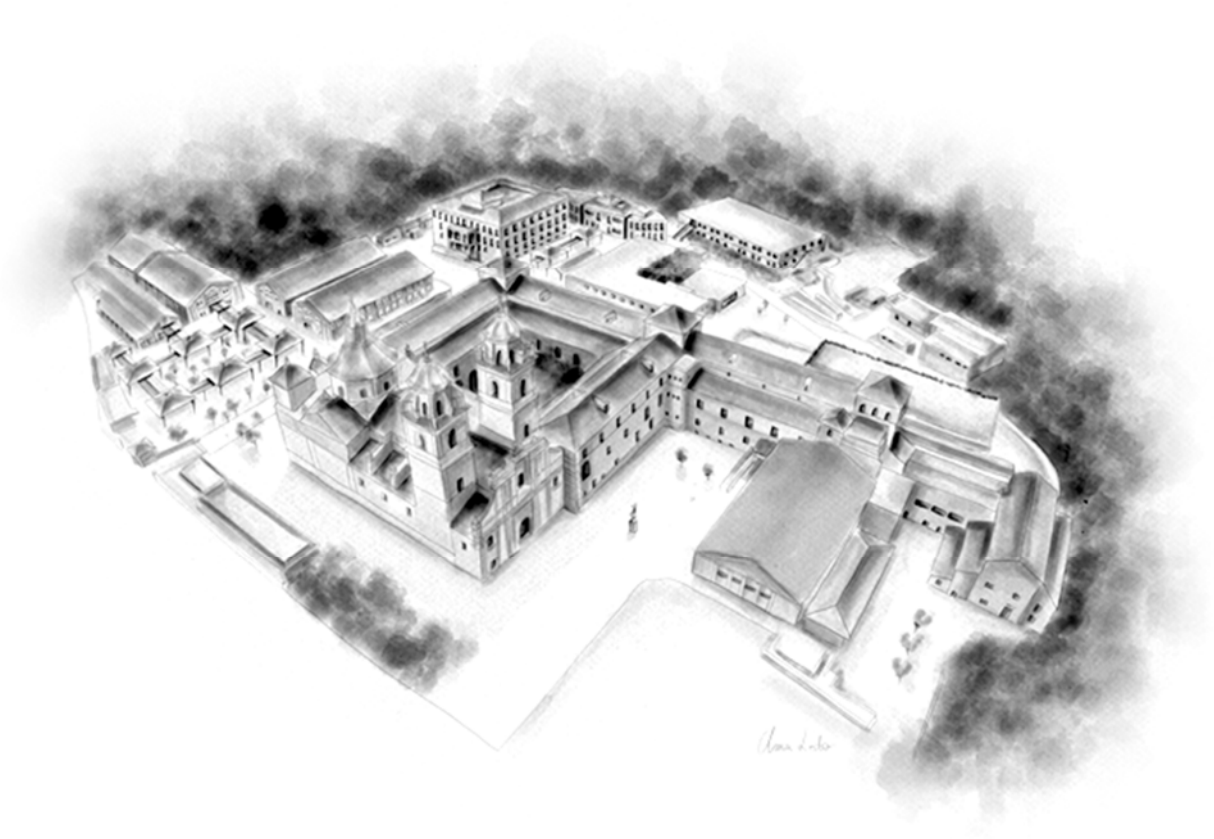
UCAM UNIVERSIDAD CATÓLICA DE MURCIA | 20 años de educación, amor y servicio

Teaching Guide 2017/2018

Statistics Applied to Business

Bachelor Business Administration

Face-to-face tuition



Statistics Applied to Business

Module: Quantitative Methods

Subject: Statistics

Character: Basic Training

ECTS: 6 ECTS.

Time period: Second course, fourth semester

Teacher: Vita Zhukova

Email: vzhukova@ucam.edu

Students' attention timetable: Tuesday 11.00-12.00

Module coordinator teacher: Mª Concepción Pérez Cárceles

Brief Description

The first part of the course on "Statistics Applied to Business" presents contents on statistical inference and during the second part introduces econometric analysis. The multidisciplinary profile of the course makes possible its application to the study of any business investigation with the purpose of improving the obtaining of significant information in a competitive and efficient manner so as to be able, based on this, to take decisions in the business field..

Previous requisites

It would be convenient for this subject, that the student had a good command of Linear Algebra, Differential Calculus, Descriptive Statistics, Probability Theory and the model of Random Variables.

Aims

1. Familiarize the student with the knowledge of statistics inference
2. Provide the student with the methodologic statistics ability to enable him to make up objective and non-speculative information, from real data.
3. Solve problems by giving economic information to mathematical solutions.
4. Enable the student to perform inferences or generalizations for the population, from the sample information data.

Competences and training results

Cross curricular competences

(T1) Ability for analysis and synthesis.

(T2) Problem solving

(T5) Computer science knowledge connected to this field of study.

(T6) Information management ability

(T7) Problem solving

(T8) Decision making

(T9) Perform teamwork.

(T14) Critical reasoning

(T16) Autonomous learning

(T22) Motivation for quality

(T24) Reflection capacity

(UCAM1) Be able to express themselves correctly in Spanish within their disciplinary field.

(UCAM5) Be able to use CIT basic tools as a user.

(UCAM6) Acquire team work ability, to work with same or different field professionals

Specific Competences

(E13) Know and apply Statistics basic concepts.

(E19) Ability to apply knowledge in practice

(E37) Identify and use.

(E38) Identify and use suitable software

(E53) Derive from data relevant information impossible to recognize by non-professionals.

(E57)Communicate fluently in its environment and work in a team.

Training results

- Understand, think and synthetize contents within Statistics scope.
- Manage and organize Statistics information acquired during the learning process.
- Know and use the possibilities that computer science offers in the study of Statistics in its different applications.
- Organize and know how to use Statistics information from different contexts.
- Acquire the necessary abilities to solve problems in the field of Statistics.
- Decide in a critical and integral manner, among the different options in case of a statistics problem, necessary to take a decision within the business scope.
- Acquire and implement collaboration strategies and abilities to foster team work in the problem solving and in decision making within Statistics scope.

- Issue sentences and take a critical stage before the diversity of the different situations faced and which need the application of a statistical technique or tool for its resolution.
- Manage the learning process in a proactive way within Statistics scope.
- Generate learning abilities to enable later studies in Statistics with a high autonomy level.
- Estimate the significance of the suitable performance of their work when it comes to problem solving within Statistics scope.
- Think in a reasonable and critical manner about questions related to the study in the field of Statistics.
- Use Statistics terminology, orthographic and grammar rules in a suitable manner, both in written and oral contexts.
- Know and use statistical resources provided by new technologies of information and communication.
- Collaborate with other professionals and recognize the contributions that other knowledge fields perform in the process of Statistics application to the professional activity.
- Have and understand the Statistics knowledge supported by text books with aspects that involve knowledge from this field of study avant-garde.
- Transcript the reality to a mathematical-statistical model for its best further understanding and analysis.
- Extract relevant information from a series of socioeconomic and business data.
- Use the different statistics descriptive and interpret the results.
- Have a good command of basic elements of probability theory.
- Know how to apply statistical inference to extract relevant information.
- Understand and apply Statistics knowledge to the practice through the elaboration and defense or well-built arguments and document.
- Apply the most convenient statistical methodology for the business problem solving.
- Be able to distinguish among the different statistical tools in terms of the criteria of effective application to the specific problems.
- Manage suitable statistical tools to solve the different economic problems.
- Know and use the different computer packages, specialized in the different knowledge areas of statistics.
- Issue sentences about aspects of statistics by gathering and interpreting relevant information, impossible to recognize by non-professionals.
- Obtain general conclusions from the information provided by the different economic problems.
- Apply descriptive Statistical methods suitable for the information available to know the magnitude of the problem.
- Estimate the validity of the possible solutions to a socio-economic problem by means of the application of Statistical inference.
- Communicate in a suitable manner and effectively, ideas, problems and solutions within the Statistics scope.
- Solve statistical problems in work teams.
- Use a logical structure and write con orthographic correction.
- Use the correct terminology in the tasks performance.

Methodology

Methodology	Hours	Face-to-face work hours	Non-face-to-face work hours
Master class (60%)	36	60 horas (40 %)	
Practice workshops (8%)	7,75		
Assessment (7%)	4,25		
Tutorials (20%)	12		
Personal study (45%)	40,50		90 horas (60 %)
Tasks (30%)	27		
Practice clases (15%)	13,50		
Bibliographic search (10%)	9		
TOTAL	150	60	90

Syllabus

Unit 1: Models of distributions.

1.1 Models of discrete random variables.

1.1.1 Bernoulli's Distribution.

1.1.2 Binomial Distribution.

1.1.3 Geometrical Distribution.

1.1.4 Negative Binomial Distribution.

1.1.5 Hypergeometric Distribution.

1.1.6 Poisson's Distribution.

1.2 Models of continuous random variables.

1.2.1 Uniform Distribution.

1.2.2 Normal Distribution.

1.2.3 Central Limit Theorem.

1.2.4 Chi-square Distribution.

1.2.5 t-Student Distribution.

1.2.6 F-Snedecor Distribution.

1.3 Practice.

Unit 2: Value estimation theory.

2.1. Statistical inference

2.2 Sample and population.

2.3 Sample methods.

2.4 Statistic, estimator and most common sample statistics.

2.5 Sample statistical distributions in normal populations.

2.6 Value estimation.

2.7 Properties of value estimations.

2.8 Value estimation methods.

2.9 Practice.

Unit 3: Confidence estimation intervals.

3.1. Confidence interval for average normal population.

3.2 Confidence interval for the variance in normal populations.

3.3 Confidence interval for the proportion in normal populations.

3.4 Practice.

Unit 4: Hypothesis significance testing

4.1 Individual hypothesis significance testing.

4.2 Joint significance testing.

4.3 Practice.

Unit 5: Model of basic linear regression.

5.1 Classical regression model.

5.2 Matrix representation model of linear regression.

5.3 Estimation of classical linear model.

5.4 Estimation properties.

5.5 Multiple regression models.

5.6 Practice.

Programme of practice teaching

Worshop 1. Models of distributions

Workshop 2. Theory of samples and Value Estimation.

Workshop 3. Estimation by Confidence Intervals.

Workshop 4. Hypothesis significance testing.

Workshop 5. Basic Linear Regression model.

Workshop 6. Research task.

Analysis of one or more economic series to choose by the student by means of the application of the methodologies studied.

Connection with other subjects of the study plan

The student should have previous knowledge of Business Mathematics I and II from the first course about linear algebra, real numbers series and calculus in one variable, as well as Fundamentals of Statistics about differential and integral calculus and descriptive statistics. On the other hand, it introduces the student to the techniques used in Econometrics of third years.

Assessment system

February/June Call

- **Theoretical part:** 80% of total grade. There will be two exams with theoretical questions, theoretical-practical questions and practices. The first exam will be 30% and second exam will be 50% of the grade.
-

  Practice part: 20% of total grade. The student's involvement in the training activities that conform the subject will be assessed through the issuing and correction of the exercises, tasks, case studies and problems carried out individually and in groups; the public presentation of some of these tasks and the taking part on the debate forums.

September Call:

- **Theoretical part**: 80%.

- **Practice part**: 20% of the total grade. The student's involvement in the training activities that conform the subject will be assessed through the issuing and correction of the exercises, tasks, case studies and problems carried out individually and in groups; the public presentation of some of these tasks and the taking part on the debate forums.

February/June Call:

The student will pass the subject in the February/June call when the arithmetic mean, according to the three grade percentages (two written exams and involvement) is equal or higher than 5, and none of the grades is lower than 5.

If the student has less than 5 points in any of the three grades (the two written exams and the involvement), he/she will have to resit to pass in September, keeping the grades equal or higher than 5.

September Call:

The student will pass the subject in September call when the arithmetic mean, according to the three grade percentages fixed in the three grades (two written exams and involvement) is equal or higher than 5, and none of the grades is lower than 5.

In case of not passing, he/she will have to resit for the complete subject in later calls.

Ranking system

The ratings system (RD 1.125/2003. from 5th September) as follows:

0-4,9 Fail (SS)

5,0-6,9 Pass (AP)

7,0-8,9 Good (NT)

9,0-10 Distinction (SB)

The "Honors" mention can be awarded to those students with a degree of 9,0 or higher. This cannot be awarded to more than 5% of the students registered in a subject in each academic year, unless the number of students registered is less than 20, when there will be awarded only one mention.

Bibliography and reference sources

Basic bibliography

- Paul Newbold, William L. Carlson, Betty M. Thorne, (2010), Statistics for business and economics. 7th ed., Upper Saddle River, N.J. : Pearson, cop. 2010

Webs associated

- http://www.bde.es/ Bank of Spain
- http://www.worldbank.org/ World Bank
- http://www.ine.es/ Instituto Nacional de Estadística

Recommendations for the study

We recommend the student to face alone practice problems in each theme after listening to the theoretical explanations.

Instructional Material

It will be necessary to have a PC with all the necessary programs installed (text editor, spreadsheet, presentation tools, etc.) We also recommend students to use memory devices (USB, CDs or DVDs) to make easier the interchange of information in presentations such as Power Point, exercises, case study, etc., during the face-to-face classes. We also recommend the use of calculator and access to the Internet. It will be necessary scientific calculator. It will be necessary internet connection.

Tutorials

Academic tutorial:

These tutorials have the aim of consolidating knowledge and abilities taught in the classes of the subject, at the same time will help to solve problems and doubts asked by the students. There will be an assessment and follow up of the different tasks in order to contribute to the understanding of the subject methodology and systems of assessment.

Personal Tutorial:

The university also has a Special Team for tutorials with the students enrolled in the degree. All students registered in UCAM have a personal tutor from the Special Tutors Team, when they register for the first time in the university; hence the student has this accompaniment during the complete university period. Criteria and aspects can be consulted in:
http://www.ucam.edu/servicios/tutorias/preguntas-frecuentes/que-es-tutoria